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Dual Color X-Rays Production from Thomson or Compton Sources at THU

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Recently, the dual color X-rays production from Thomson/Compton sources has been demonstrated on the high brightness linac at Accelerator Laboratory of Tsinghua University (THU). We present two simple schemes for producing two-color Thomson/Compton radiation with the possibility of controlling time separation of the two different colors, respectively based on the interaction of one single electron beam with two light pulses that one is generated by second harmonic generation (SHG) of another, and the interaction of two different-energy electron bunches with two light pulses centered at the same wavelength. The X-rays were spectrally measured by the distribution images obtained by HOPG crystal diffraction, and the experimental results were consistent with the theoretical simulations. there are widely applications of the dual-color X-rays. One of the most promising applications is the pump-probe experiment which can open the door for scientists to study the structural dynamics on the atomic and molecular scale.

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